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VERIFICATION OF A TRANSLATION

I, the below named translator, hereby declare that:

My name and post office address are as stated below;

That I am knowledgeable in the German language in which the below identified international application was filed, and that, to the best of my knowledge and belief, the English translation of the amended sheets of the international application No. PCT/DE2004/000839 is a true and complete translation of the amended sheets of the above identified international application as filed.

I hereby declare that all the statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the patent application issued thereon.

Date: September 30, 2005

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New claims

1. A method for simulating musculoskeletal strains on a patient for monitoring surgical interventions, said method comprising the following steps:

   a. Determination of individual musculoskeletal parameters of the patient, particularly by automatic measurement of anthropometric parameters, automatic derivation of anthropometric parameters from a system for computer-assisted surgery, particularly a surgical navigation system, and/or the position and/or orientation of joints;

   b. Automatic determination of the individual musculoskeletal strains from the determined musculoskeletal parameters of the patient; and

   c. for the automatic determination of the individual musculoskeletal strains, the individual and the varied musculoskeletal parameters are compared with musculoskeletal reference parameters filed in a strain database constructed with empirical data, and musculoskeletal reference strains corresponding to the musculoskeletal reference parameters are determined as the individual musculoskeletal strains, the musculoskeletal reference parameters being present as discrete values in the strain database and the musculoskeletal reference parameters being compared with the individual musculoskeletal parameters by means of functional relationships, particularly by means of interpolation;

d. Computer-assisted evaluation of the individual musculoskeletal strains in respect of at least one target criterion, particularly in respect of the contact

forces or the degree of movement of a joint or in respect of the fragment movements of a fracture.

2. The method as claimed in claim 1, comprising the following additional steps:

e. Variation of at least one musculoskeletal parameter, particularly the position and/or orientation of a joint;

f. Renewed automatic determination of the individual musculoskeletal strains taking into consideration the at least one varied musculoskeletal parameter;

g. Renewed computer-assisted evaluation of the individual musculoskeletal strains in respect of the at least one target criterion.

3. The method as claimed in claim 2, characterized in that steps e. to g. are repeated until a specified target value of at least one target criterion is reached.

4. The method as claimed in claim 3, characterized in that the musculoskeletal parameters corresponding to the target value are output on an output unit, stored in a storage unit and/or transferred to a computer-assisted surgery system and/or to a surgical navigation system.

5. The method as claimed in claim 3 or 4, characterized in that the individual and varied musculoskeletal parameters corresponding to the target value

serve as a basis for planning a surgical intervention, particularly as a basis for the choice of components, the positioning of components or the decision regarding the removal of temporary implants.

6. The method as claimed in one of claims 2 through 5, characterized in that the variation of the individual musculoskeletal parameters in step e. is carried out taking into consideration predefinable data for implants, particularly their dimensions and ranges of movement.

7. The method as claimed in one of the preceding claims, characterized in that the individual musculoskeletal strains are calculated from the determined individual musculoskeletal parameters.

8. The method as claimed in claim 7, characterized in that a biomechanical and/or a mathematical model is used as a basis for the calculation of the individual musculoskeletal strains.

9. The method as claimed in claim 8, characterized in that the biomechanical and/or mathematical model is adapted to the individual musculoskeletal parameters.

10. The method as claimed in claim 8 or 9, characterized in that the biomechanical and/or mathematical model is chosen on the basis of the determined individual musculoskeletal parameters from at least one database.

11. The method as claimed in one of claims 9 through 11, characterized in that the individual musculoskeletal strains are calculated with the aid of a musculoskeletal model taking into consideration the individual patient anatomy.

12. The method as claimed in one of the preceding claims, characterized in that the individual musculoskeletal strains are visualized for evaluation.

13. The method as claimed in one of the preceding claims, characterized in that the individual musculoskeletal strains are presented on the basis of an anatomical model, particularly in graph form and/or numerically.

14. The method as claimed in one of the preceding claims, characterized in that, by evaluation of the individual musculoskeletal strains, a rehabilitation process is evaluated and/or managed, particularly by means of Internet access.

15. The method as claimed in one of the preceding claims, characterized in that the individual musculoskeletal parameters of the patient are determined by measurements.

16. The method as claimed in claim 15, characterized in that at least one of the individual musculoskeletal parameters is measured automatically, particularly by image analysis, computed tomography and/or motion sensors.

17. The method as claimed in one of the preceding claims, characterized in that individual movement parameters, particularly gait parameters, are determined, and these are used for the automatic determination of individual musculoskeletal strains.

18. The method as claimed in claim 17, characterized in that the individual gait parameters are determined from personal data stored in a database and/or are recorded individually for one person.

19. The method as claimed in one of the preceding claims, characterized in that the position and/or orientation of joints are used for a navigation system for computer-assisted surgery and/or the data from a navigation system are used for computer-assisted surgery.

20. A device for evaluating musculoskeletal strains on a patient, with means for carrying out the method as claimed in one of the preceding claims.

21. A movement analysis system, in particular a gait analysis system, characterized in that it is coupled to a device as claimed in claim 20.

22. A navigation system for computer-assisted surgery for carrying out the method as claimed in claims 1 through 19.

New claims

1. A method for simulating musculoskeletal strains on a patient, especially for preparing or monitoring surgical interventions and/or for planning or monitoring rehabilitation, said method comprising the following steps:

a. Determination of individual musculoskeletal parameters of the patient, particularly by automatic measurement of anthropometric parameters, automatic derivation of anthropometric parameters from a system for computer-assisted surgery, particularly a surgical navigation system, and/or the position and/or orientation of joints;

b. Automatic determination of the individual musculoskeletal strains from the determined musculoskeletal parameters of the patient; where

c. for the automatic determination of the individual musculoskeletal strains, the individual and the varied musculoskeletal parameters are compared with musculoskeletal reference parameters filed in a database, and musculoskeletal reference strains corresponding to the musculoskeletal reference parameters are determined as the individual musculoskeletal strains, the musculoskeletal reference parameters being present as discrete values in the database and the musculoskeletal reference parameters being compared with the individual musculoskeletal parameters by means of

functional relationships, particularly by means of interpolation.

d. Computer-assisted evaluation of the individual musculoskeletal strains in respect of at least one target criterion, particularly in respect of the contact.

forces or the degree of movement of a joint or in respect of the fragment movements of a fracture.

2. The method as claimed in claim 1, comprising the following additional steps:

e. Variation of at least one musculoskeletal parameter, particularly the position and/or orientation of a joint;

f. Renewed automatic determination of the individual musculoskeletal strains taking into consideration the at least one varied musculoskeletal parameter;

g. Renewed computer-assisted evaluation of the individual musculoskeletal strains in respect of the at least one target criterion.

3. The method as claimed in claim 2, characterized in that steps e. to g. are repeated until a specified target value of at least one target criterion is reached.

4. The method as claimed in claim 3, characterized in that the musculoskeletal parameters corresponding to the target value are output on an output unit, stored in a storage unit and/or transferred to a computer-assisted surgery system and/or to a surgical navigation system.

5. The method as claimed in claim 3 or 4, characterized in that the individual and varied musculoskeletal parameters corresponding to the target value

serve as a basis for planning a surgical intervention, particularly as a basis for the choice of components, the positioning of components or the decision regarding the removal of temporary implants.

6. The method as claimed in one of claims 2 through 5, characterized in that the variation of the individual musculoskeletal parameters in step d. is carried out taking into consideration predefinable data for implants, particularly their dimensions and ranges of movement.

7. The method as claimed in one of the preceding claims, characterized in that the individual musculoskeletal strains are calculated from the determined individual musculoskeletal parameters.

8. The method as claimed in claim 7, characterized in that a biomechanical and/or a mathematical model is used as a basis for the calculation of the individual musculoskeletal strains.

9. The method as claimed in claim 8, characterized in that the biomechanical and/or mathematical model is adapted to the individual musculoskeletal parameters.

10. The method as claimed in claim 8 or 9, characterized in that the biomechanical and/or mathematical model is chosen on the basis of the determined individual musculoskeletal parameters from at least one database.

11. The method as claimed in one of claims 9 through 11, characterized in that the individual musculoskeletal strains are calculated with the aid of a musculoskeletal model taking into consideration the individual patient anatomy.

12. The method as claimed in one of the preceding claims, characterized in that the individual musculoskeletal strains are visualized for evaluation.

13. The method as claimed in one of the preceding claims, characterized in that the individual musculoskeletal strains are presented on the basis of an anatomical model, particularly in graph form and/or numerically.

14. The method as claimed in one of the preceding claims, characterized in that, by evaluation of the individual musculoskeletal strains, a rehabilitation process is evaluated and/or managed, particularly by means of Internet access.

15. The method as claimed in one of the preceding claims, characterized in that the individual musculoskeletal parameters of the patient are determined by measurements.

16. The method as claimed in claim 15, characterized in that at least one of the individual musculoskeletal parameters is measured automatically, particularly by image analysis, computed tomography and/or motion sensors.

17. The method as claimed in one of the preceding claims, characterized in that individual movement parameters, particularly gait parameters, are determined, and these are used for the automatic determination of individual musculoskeletal strains.

18. The method as claimed in claim 17, characterized in that the individual gait parameters are determined from personal data stored in a database and/or are recorded individually for one person.

19. The method as claimed in one of the preceding claims, characterized in that the position and/or orientation of joints are used for a navigation system for computer-assisted surgery and/or the data from a navigation system are used for computer-assisted surgery.

20. A device for evaluating musculoskeletal strains on a patient, with means for carrying out the method as claimed in one of the preceding claims.

21. A movement analysis system, in particular a gait analysis system, characterized in that it is coupled to a device as claimed in claim 20.

22. A navigation system for computer-assisted surgery for carrying out the method as claimed in claims 1 through 19.